Lightweight Small Caliber Ammunition

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This Presentation is Approved for Public Release
Lightweight Small Caliber Ammunition

“The dismounted infantryman continues to be over-burdened while conducting modern combat operations…”

“Reduce Combat Load through doctrine and equipment changes…”

Natick Soldier Center, March 2005
Lightweight Small Caliber Ammunition

Soldier Load

M240B Machine Gunner

Average Fighting Load 81.4 lbs

of which 6.3 lbs is ammunition
Family of 7.62mm Caliber Ammunition

Blank: M82
Ball: M80
Trace: M62
OHF: M62
Special: M118LR
Match: M852
Dim: M276
Lightweight Small Caliber Ammunition

Objective

To develop a functional alternative lightweight 7.62mm cartridge case for the M80 Ball and M62 tracer cartridges that meets current ballistic performance and reliability of the current brass alloyed cartridge case
Lightweight Small Caliber Ammunition

**Concept:**
Thinwall Stainless Steel Cartridge Case

**Contractor:**
GDOTS Canada (Prime Contractor)

**Tasks:**
- Design a 7.62mm Lightweight Cartridge Case
- Fabricate Cartridge Cases
- Test Full Up Cartridges in a Mann Barrel and Machine Gun
Lightweight Small Caliber Ammunition

Goal

- Weight savings of 20% over the M80 Ball Brass Cartridge
- Accomplished by thinwall steel replacing current brass case
- Aluminum plug is used in the base to provide structural support
**7.62mm Weight Savings w/ Alternative Cartridge Case Materials**

<table>
<thead>
<tr>
<th>Alternative Case Weight Reduction</th>
<th>M80 Assembled Cartridge Weight Savings</th>
<th>Unit Weight M80 Ball Cartridge (gr)</th>
<th>Ammo Combat Load Gunner** (100rds)</th>
<th>Weight Savings (lbs)</th>
<th>Ammo Combat Load Assistant Gunner*** (400rds)</th>
<th>Weight Savings (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.62 Brass</td>
<td>0%</td>
<td>0%</td>
<td>392</td>
<td>6.3</td>
<td>0</td>
<td>29.2</td>
</tr>
<tr>
<td>GDOTS Steel</td>
<td>31%</td>
<td>20%</td>
<td>318</td>
<td>5.1</td>
<td>1.2</td>
<td>23.6</td>
</tr>
</tbody>
</table>

**Weight Distribution Current 7.62mm**

<table>
<thead>
<tr>
<th></th>
<th>Case</th>
<th>Bullet</th>
<th>Propellant</th>
<th>Primer / lacquer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>7.62mm</strong></td>
<td>48%</td>
<td>38%</td>
<td>12%</td>
<td>2%</td>
</tr>
</tbody>
</table>

**Gunner Combat Load total 81.4 lbs / 6.3 lbs ammo**

**Assistant Gunner Combat Load 69.9 lbs / 29.2 lbs ammo**
Lightweight Small Caliber Ammunition

**Approach**

**GDOTS Canada** – Expertise in Ammunition Production
Current Second Source for production of Small Arms Ammunition

**Fleximation** – Patented Thin Wall Steel Concept

**O C Eyelet** – Expertise in Commercial Metal Stamping Processes

**ARDEC** – Expertise in Computer Modeling and Simulation
Lightweight Small Caliber Ammunition

**Process**

**Currently** – Brass cartridge case is a base draw process

**Concept** – Sheet metal folding process
Demonstrated the feasibility of a lightweight 7.62mm cartridge based on thinwall stainless steel technology
Lightweight Small Caliber Ammunition

Results:

- Stainless Steel
  Costs less than Brass

- Simplified Manufacturing Process
  Opens Markets for Other Manufacturers

- 20% of total weight of 7.62mm M80 Ball assembled cartridge

- Ballistic Performance matches current Military MIL-C-46931 Specifications
## Further Information

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